Overview of the evaluation of management procedures in the IOTC and other tRFMOs

Iago MOSQUEIRA – WPM

MPD01 - MAY 2014

BACKGROUND

- COM tasked SC with MSE work
- SC tasked WPM with development of MSE
  1. Develop OMs and HCRs
  2. Test draft MPs
- WPM04 2012 MSE launch
- WPM MSE Workshops 2013
- WPM MSE Workshop 2014
- WPM05 DEC 2014
- Res. 13/10 On interim T&LRPs and a decision framework

iotc ctoi

How are we doing it?

- Use of simulation tools to carry out experiments
- A “real” system vs. perceived one
- Assess the robustness of management to uncertainties
- Success at achieving objectives

MSE / OMP

- OMP: Operational Management Procedure, a.k.a.
- MSE: Management Strategy Evaluation

Simulate the **expected** *performance of a management plan given a set of* **observations**, **uncertainties** *and* **assumptions** *about the system. (After Rademeyer et al., 2007)*

Components of MSE

- OM: Operating Model

  Statistical representation of the real system employed in the simulation trials to compare against how the system is perceived by the MP. Should incorporate our best knowledge and the key uncertainties, quantified as best as possible.

- Conditioning

  Process by which the OM is constructed, usually via an statistical procedure.

Components of MSE

- MP: Management Procedure

  The combination of data collection, analysis (including or not an stock assessment), and decision rule that provides one or more management quantities (TAC, effort, . . .). Must be simulation tested to be robust to uncertainties.

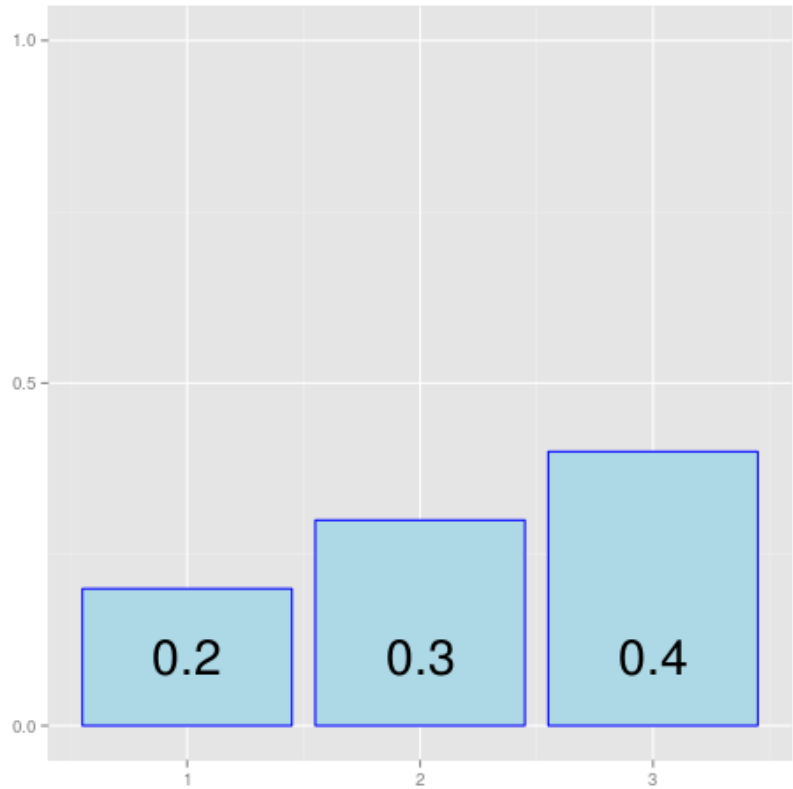
- HCR: Harvest Control Rule

  An algorithm to propose or decide on the appropriate management action given the level of certain indicators, in order to achieve some pre-specified objectives.

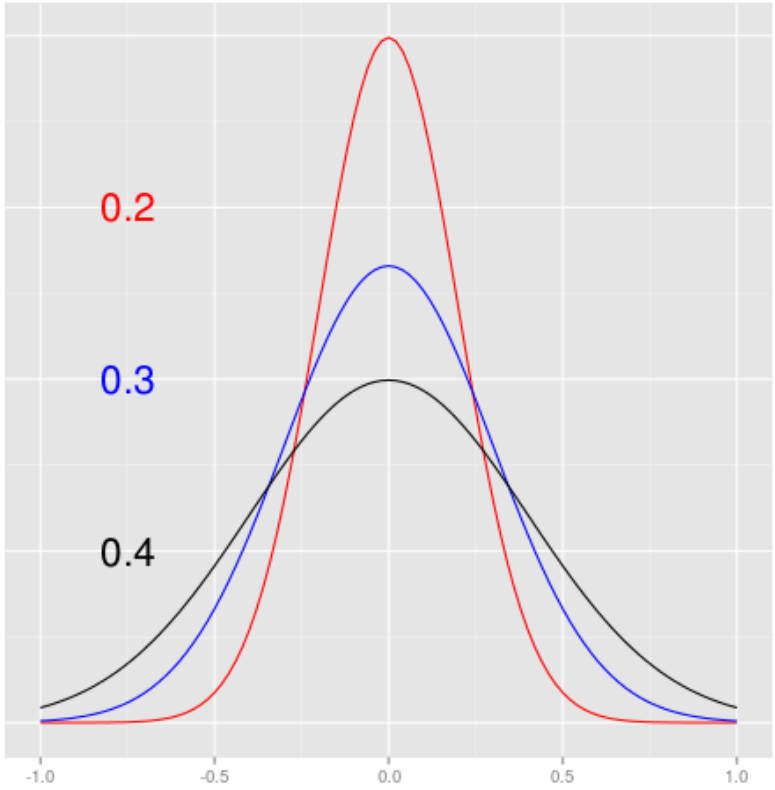
ALB OM

- Stock assessment as starting point
- Identify main uncertainties
- Model stock under various scenarios
- Add all uncertainty in stock status
- Test MPs

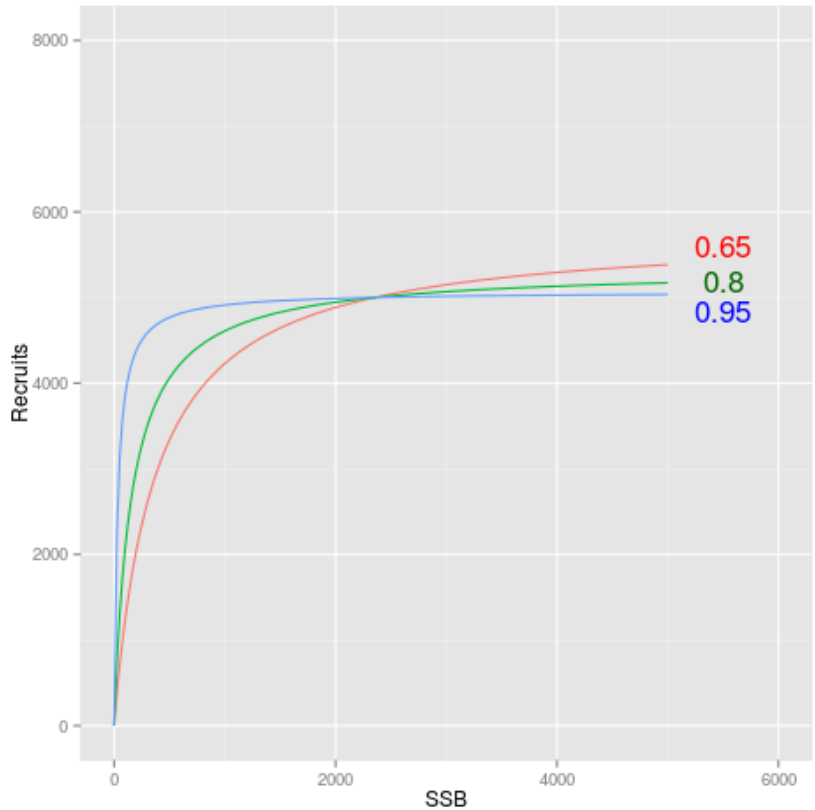
Natural Mortality



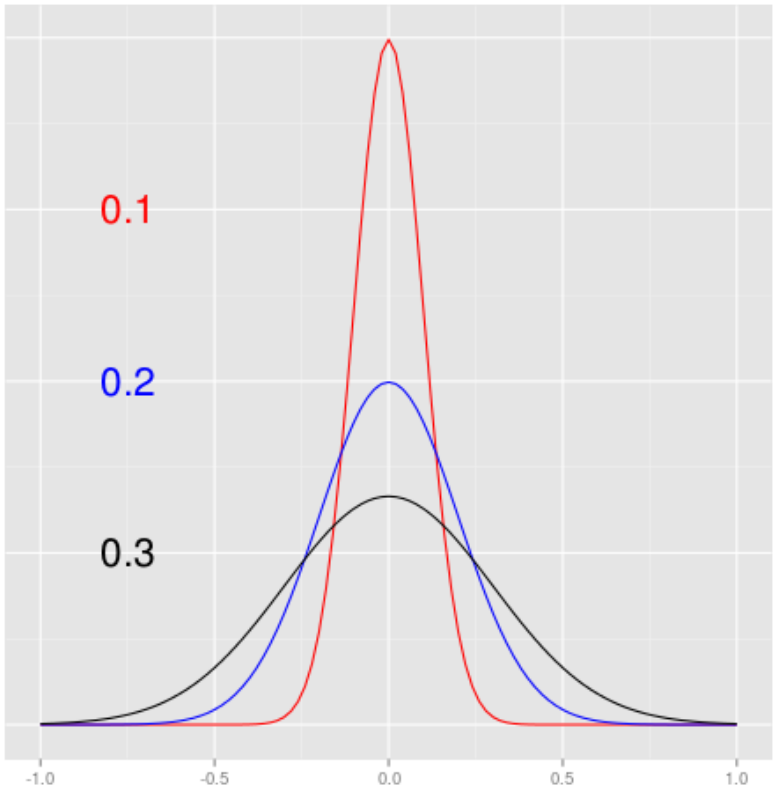
Variability in recruitment



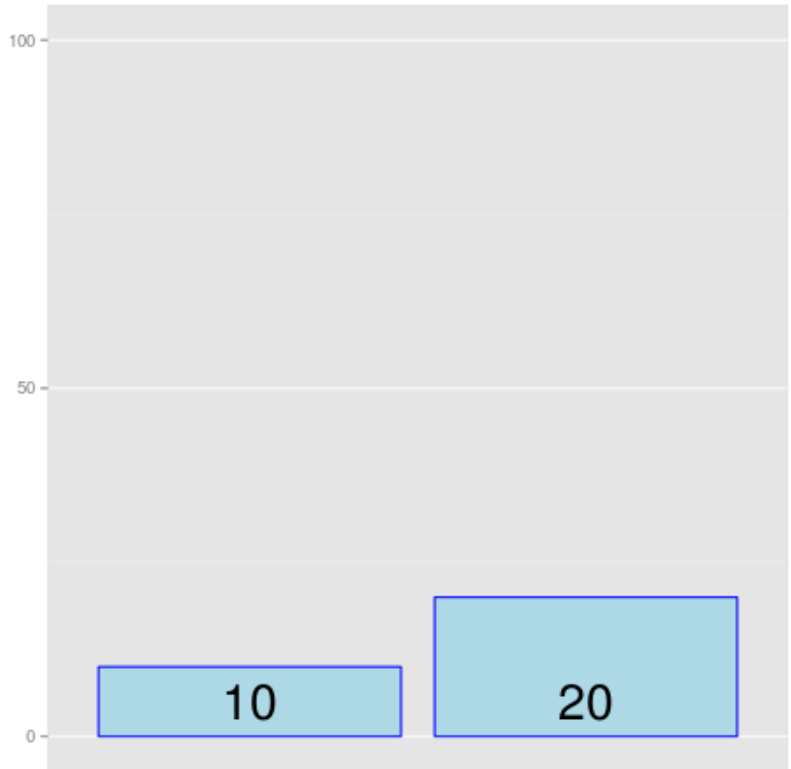
Steepness in recruitment



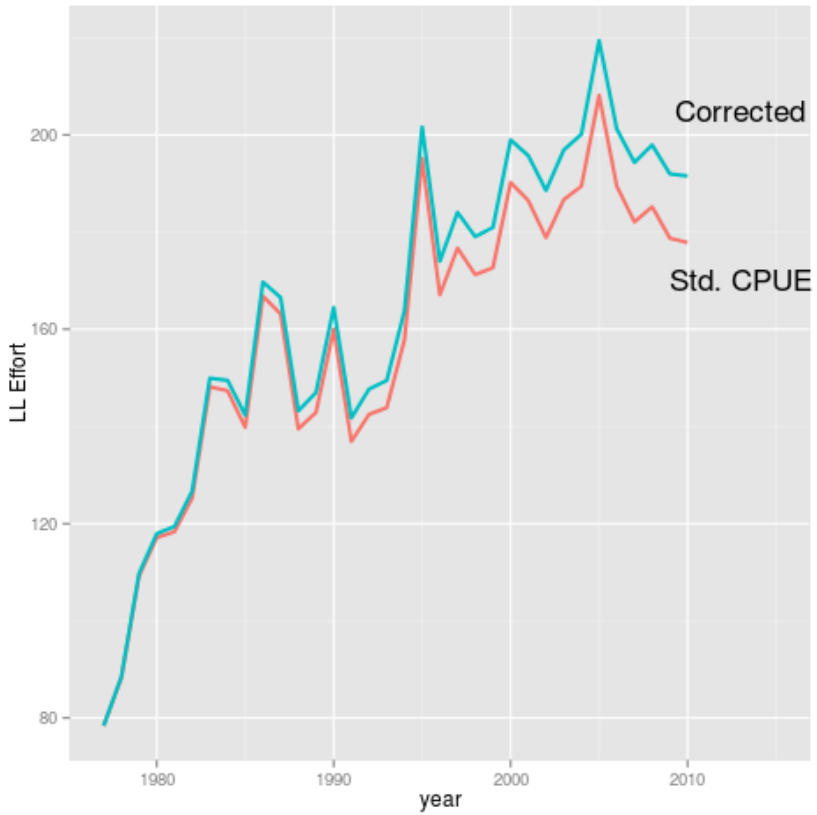
Variance in LL CPUE



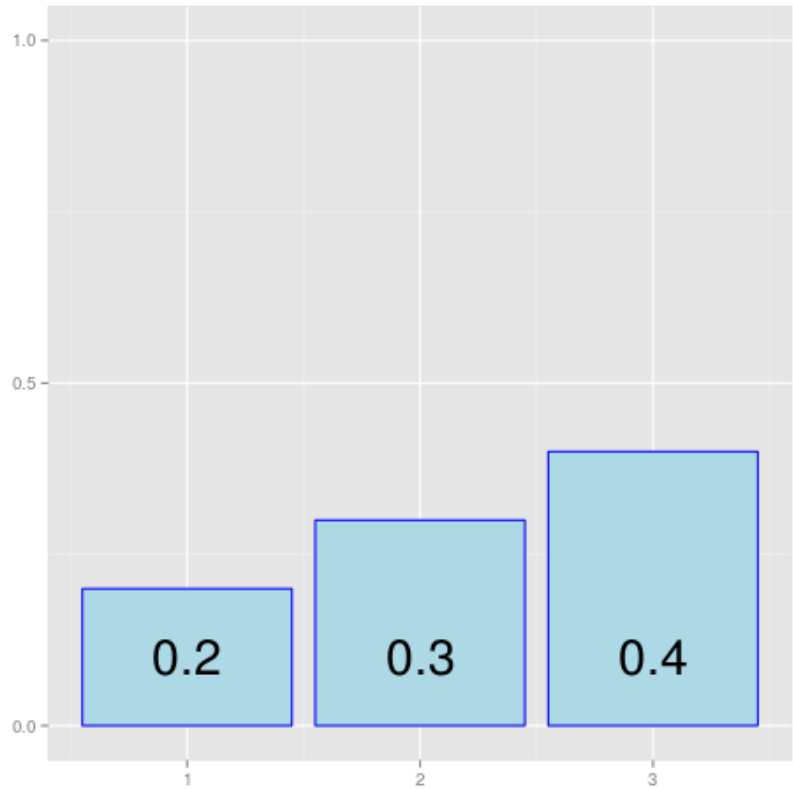
Weight of length sampling data



Changes in LL catchability



Shape of LL selectivity



ALB OM

Factor	Levels
M, natural mortality at age	0.2, 0.3, 0.4
sigmaR, variance in recruitment	0.2, 0.4, 0.6
h, stock-recruit steepness	0.65, 0.8, 0.95
CV(CPUE), CV in LL CPUE series	0.1, 0.2, 0.3
ESS, weight to length data in lkhd	10, 20
TWN LL Q, change in catchability	1.00, 1.0025
TWN LL select, selectivity TWN LL	Logarithmic, Double normal

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> 3*3*3*3*2*2*2
[1] 648
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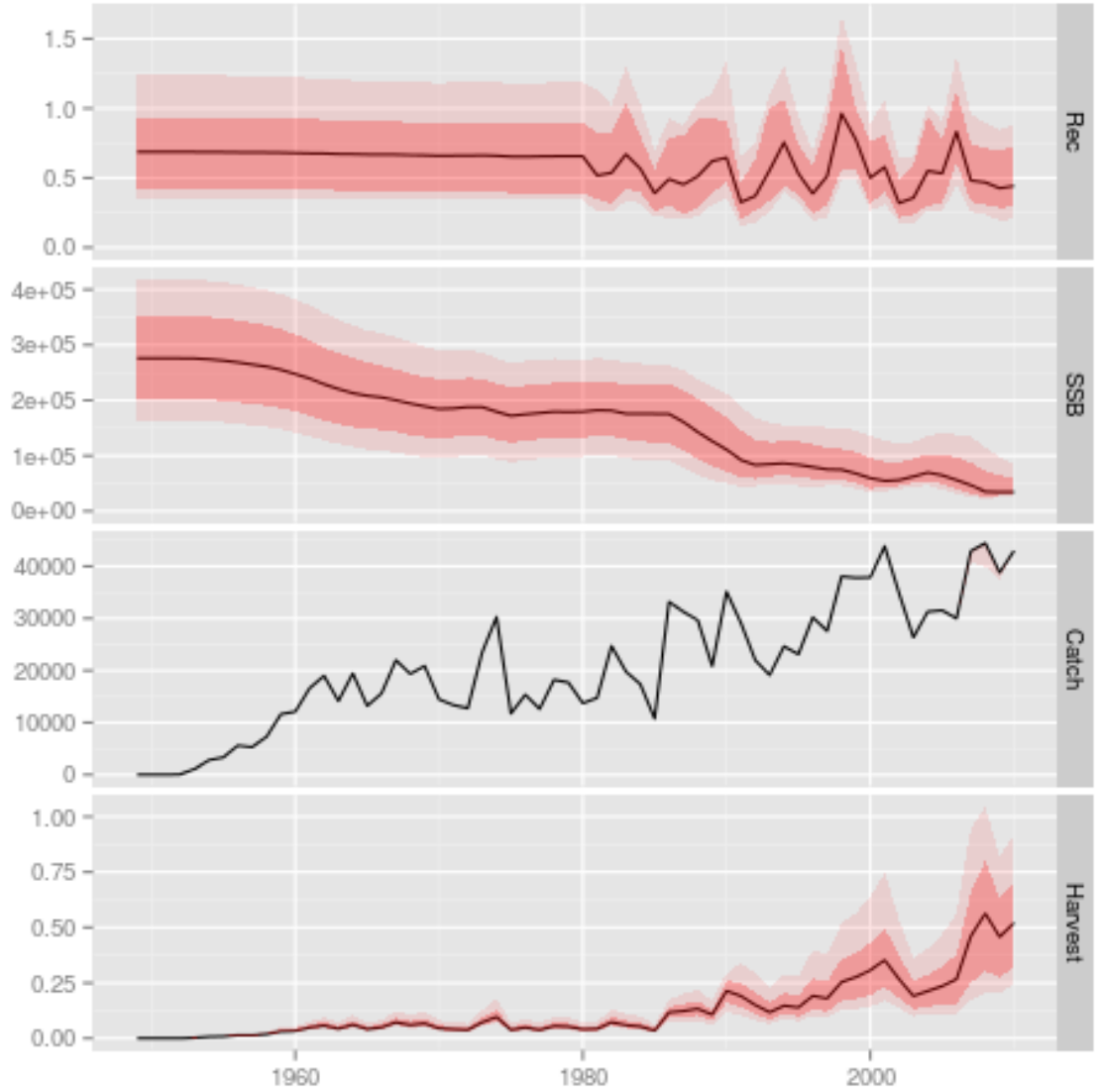
ALB OM


Rec
SSB
Catch
Harvest
1.5
1.0
0.5
0.0
4e+05
3e+05
2e+05
1e+05
0e+00
40000
30000
20000
10000
0
1.00
0.75
0.50
0.25
0.00
1960
1980
2000

ALB Test Objectives

TARGETS

- SSB = SSB@MSY
- F = F@MSY

LIMITS

- SSBLim: 0.4 * SSB@MSY
- FLim: 1.4 * F@MSY

ALB Test Objectives

EXAMPLE OBJECTIVES

- P(SSB >= SSB@MSY) > 60%
- P(F <= F@MSY) > 60%
- P(SSB > SSBLim) > 95%
- P(F < FLim) > 95%

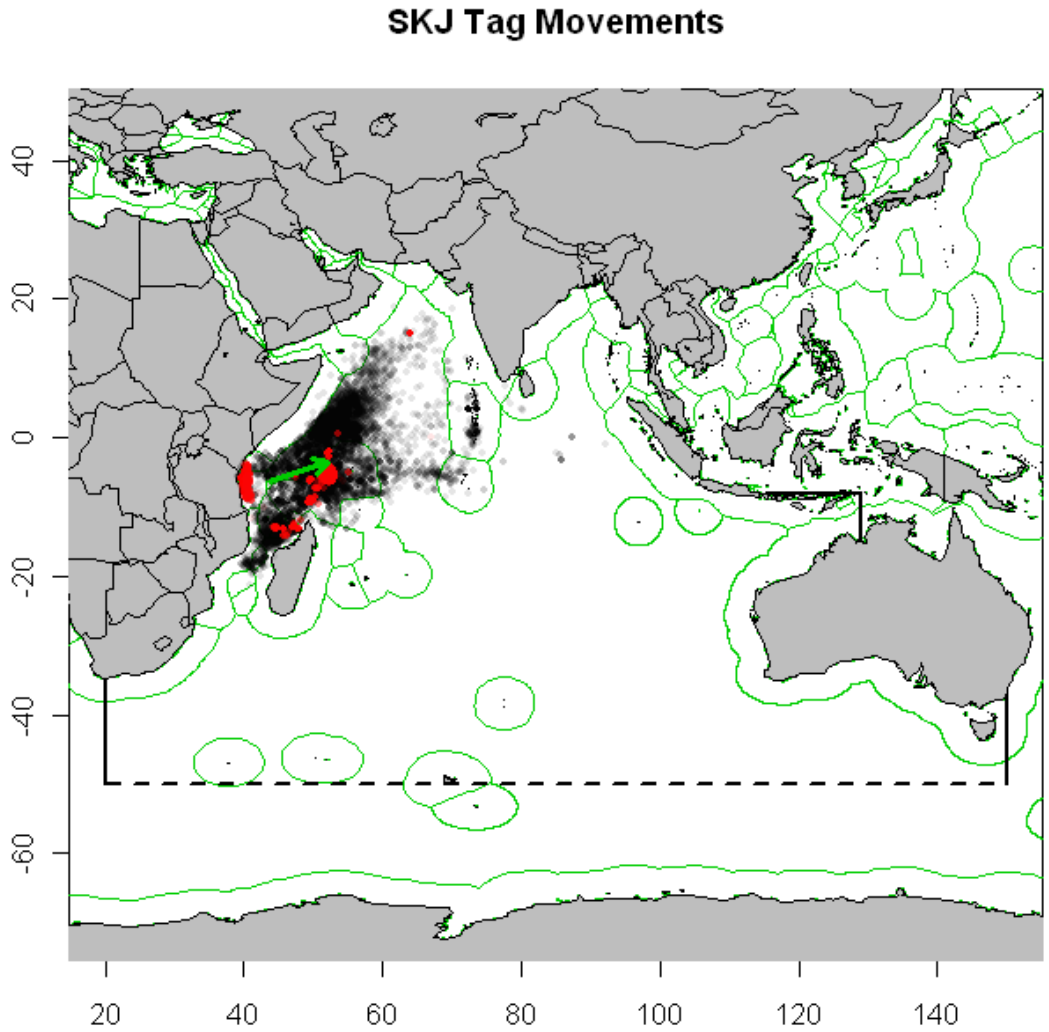
EXAMPLE PERFORMANCE MEASURES

- P(SSB_y,end >= SSB@MSY)
- P(F_y,end >= F@MSY)
- Median C_y, Var C_y

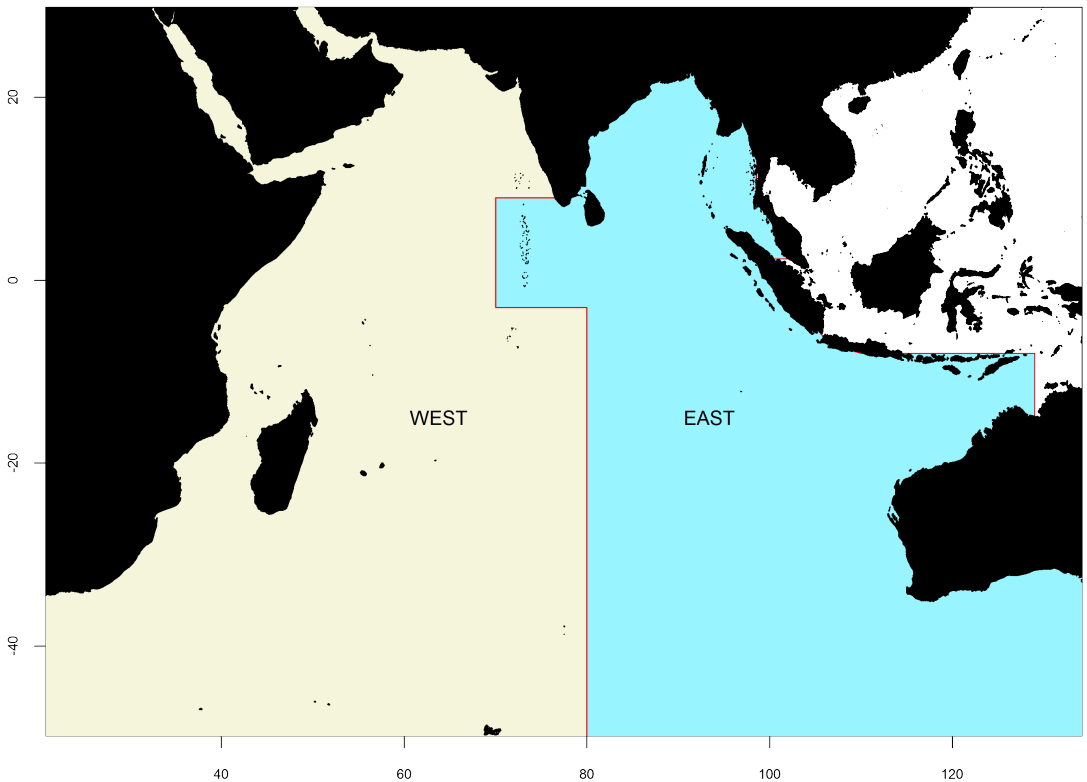
Current status: SKJ

- Work in progress
- Tailor-made OM
  - Quaterly 1950-2013
  - PS, PL, GN, LI, OT
  - Length based
- Three regions:
  - Western
  - Maldives
  - Eastern

SKJ: spatial structure



SKJ: spatial structure



Developments: BET & YFT

- Plans for work to start soon
- Link SKJ + YFT + BET OMs and MPs

WPM Workplan (ALB, SKJ)

- MAY-JUN: Refine models
- JUN: Finalise OMs
- JUL-SEP: Evaluate simple HCRs
- OCT: MSE small group Workshop
- OCT-NOV: Further runs
- DEC: WPM, SC
- MPD in 2015?

Other t-RFMOs

ICCAT

- Evaluation of RPs and HCRs
- Dialogue SC-COM
- BFT, ALB

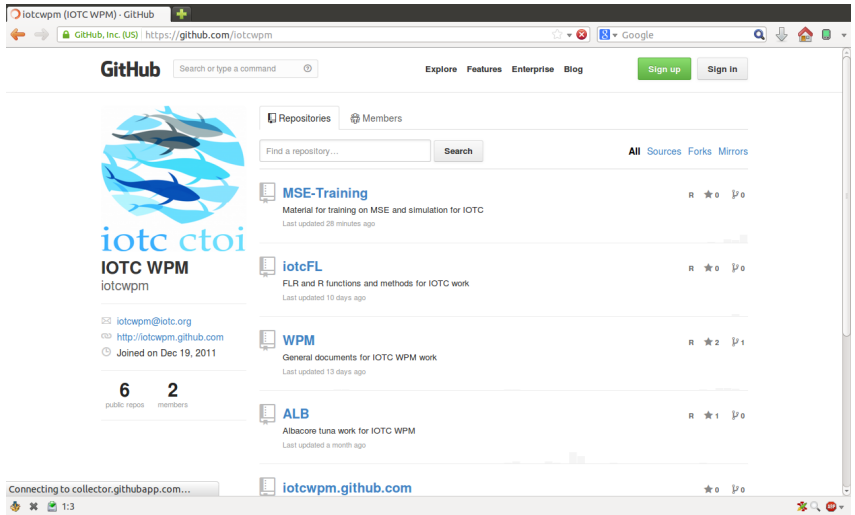
WCPFC

- Simulation of HCRs without feedback
- Limit RPs

t-RFMO MSE WG

- Setup after Kobe II
- Working online as exchange of ideas

Working Party on Methods - IOTC



http://github.com/iotcwpm

Iago MOSQUEIRA

EC JRC, IPSC Maritime Affairs G03, Ispra (IT)

iago.mosqueira@jrc.ec.europa.eu